Figure Checklist

- ❑ clear message
- ❑ visibility of data
- ❑ size & arrangement
- ❑ units & labels

- ❑ font
- ❑ lines
- ❑ colors
- ❑ consistency

Figure Legend Checklist

- ❑ title
- ❑ brief method/ experimental design
- ❑ one sentence results (for data)
- ❑ statistics (sample size, p-value...)
- ❑ definition of abbreviations, arrows, etc
- ❑ approx. 100-200 words max.
- ❑ source (if from internet/ book)

For reports

- ❑ one title for all figure panels
- ❑ figure number 1, 2, 3
- ❑ label panels A, B, C

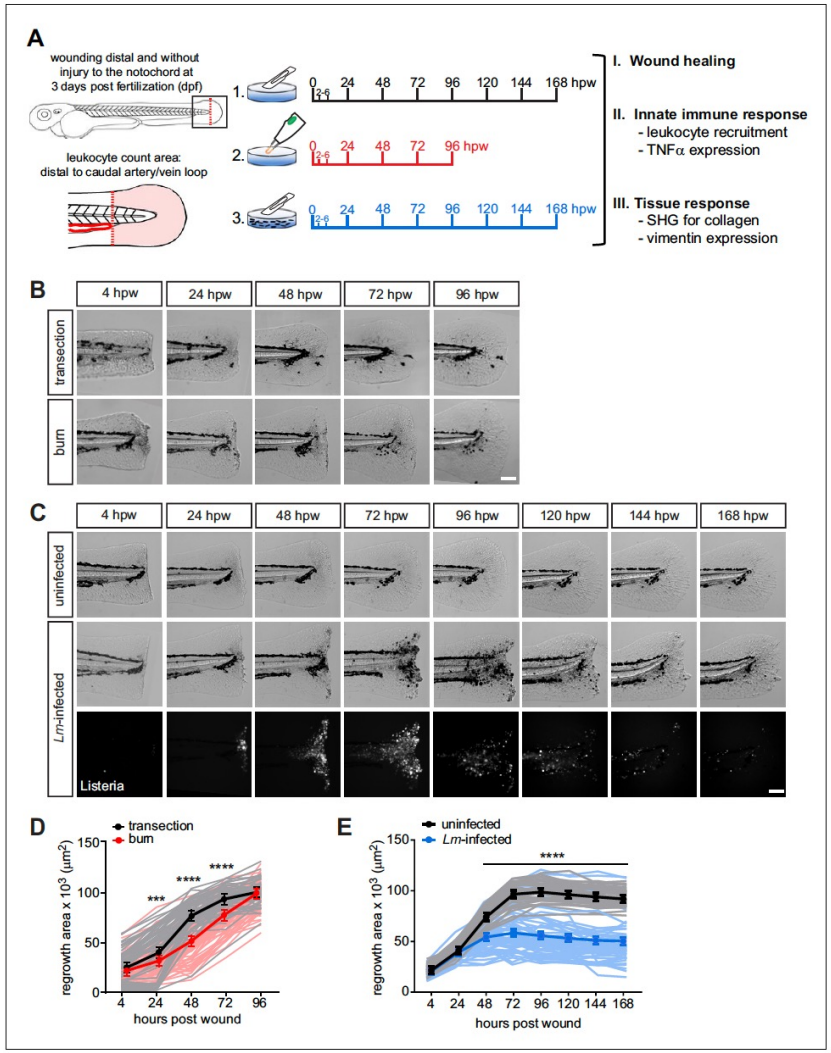


Figure 1. Caudal fin recovers from thermal injury, while wound healing is impaired in the presence of infection. (**A**) Experimental schematic and analyses. (**B**) Single-plane brightfield images of caudal fin area of individual wild-type larvae over time in response to simple transection or thermal injury, and in (**D**) the corresponding quantification of tissue regrowth area. Values are least square means and SE from three biological replicates with associated p values. Total N = 62–71 larvae per time point for each treatment. (**C**) Single-plane brightfield or fluorescent images of caudal fin area of

Figure 1 continued on next page

publication Miskolci et al. Elife 2019

How to Design Scientific Figures & Legends

Workshop BIO-203

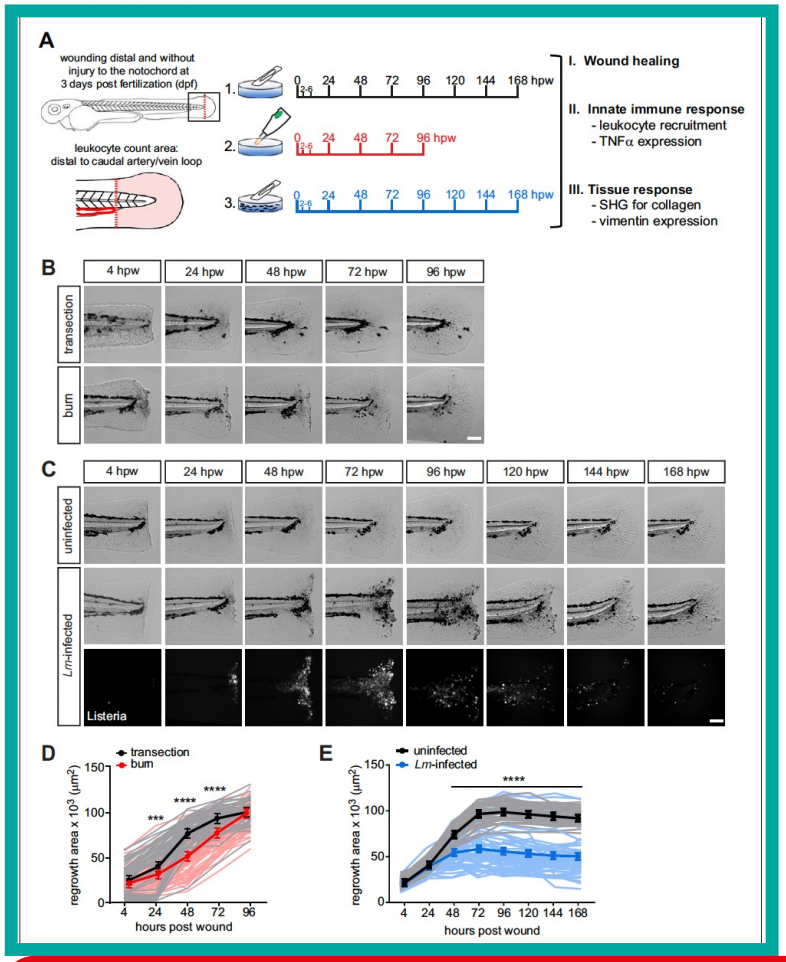
by Alexandra Bezler

Scientific Figure: What is it?

1) figure transmits a message visually

2) legend describes the figure

eLIFE Research advance Miskolci et al. Elife 2019 Cell Biology



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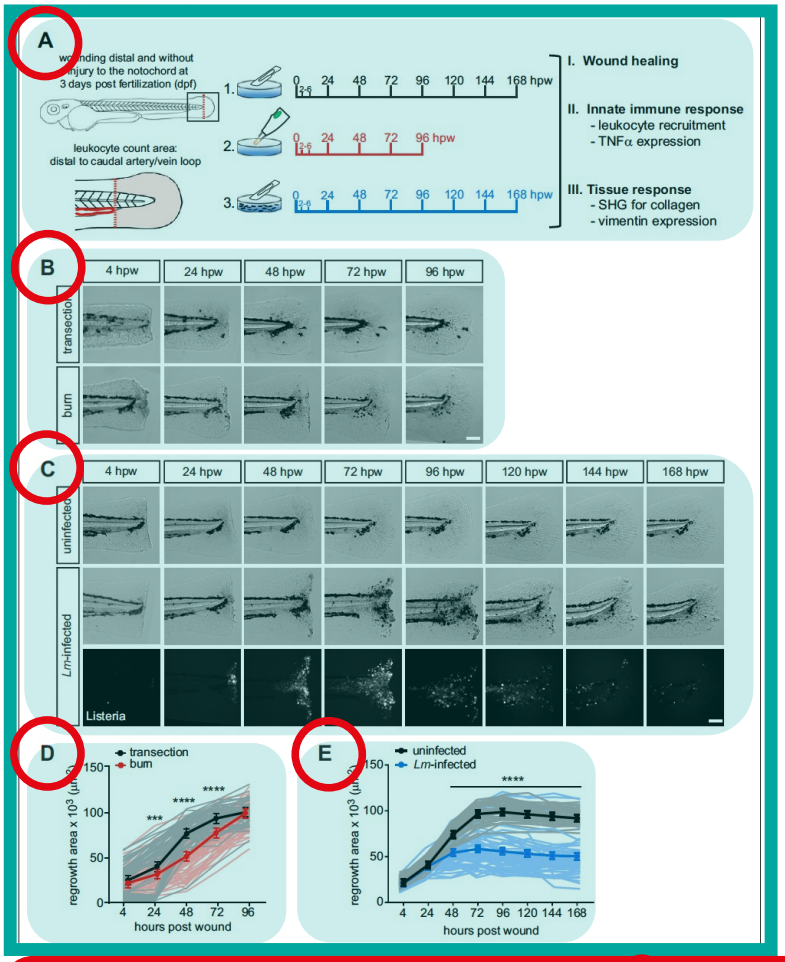
Scientific Figure: What is it?

1) figure — **panels**

2) legend — describes **each** panel

in ELN 1 panel
= 1 figure



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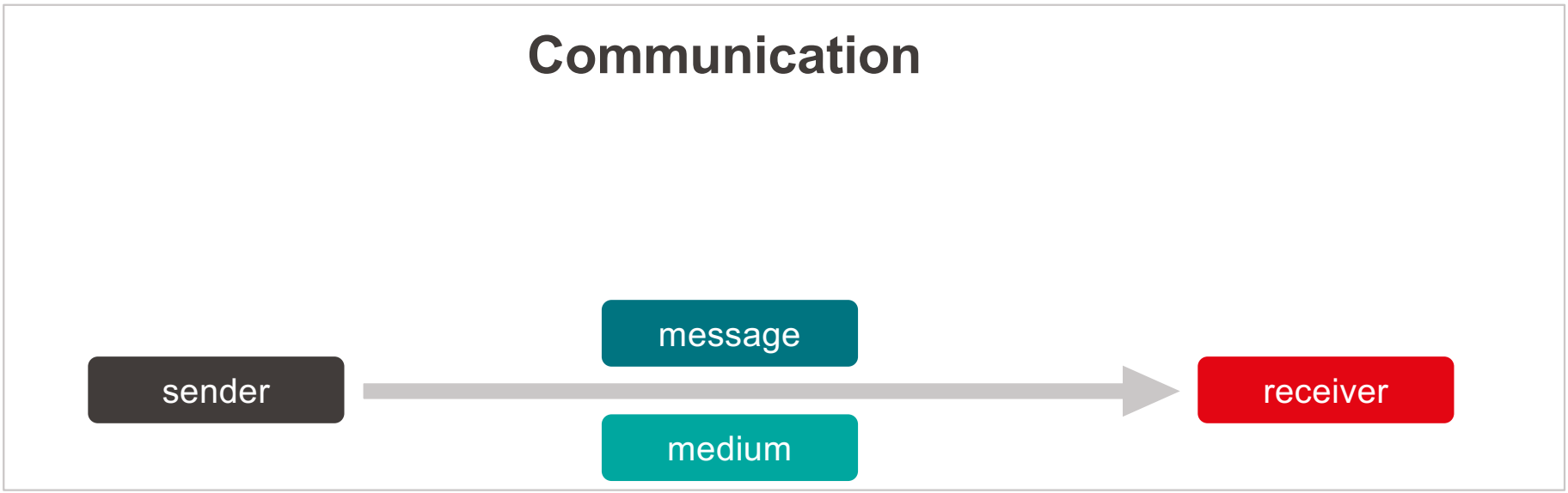
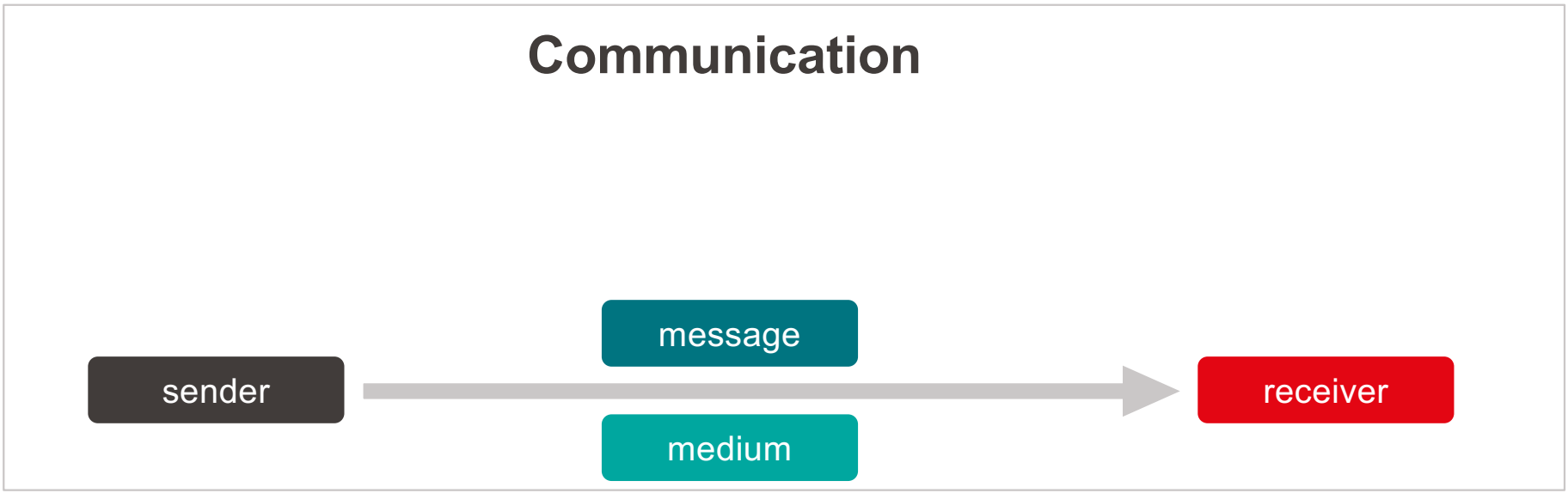
Today's menue

- basics figure design
- writing figure legends
- figure + legend checklist
- evaluation criteria ELN

Know Your Audience



Adapt the Message to the Audience



Who is the audience?

- specialist (ELN)
- scientist (other field)
- general public
- kids

Published Article

format similar to your group report/ poster

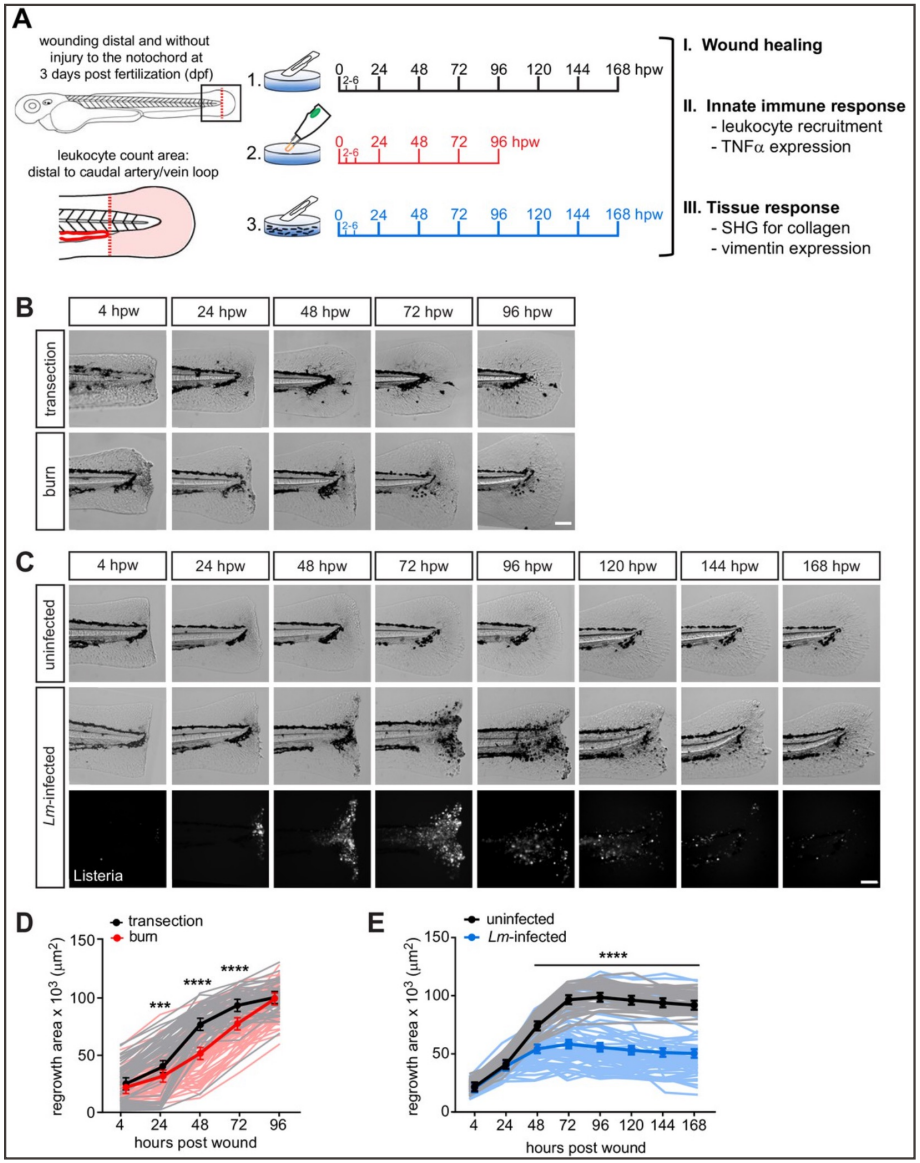


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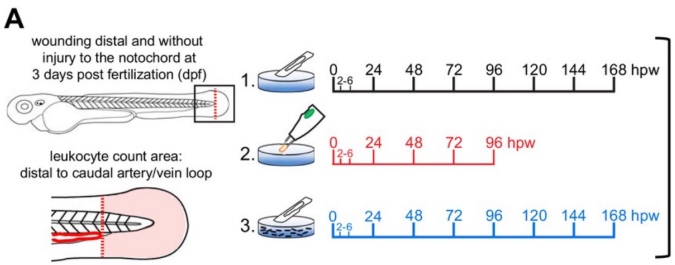
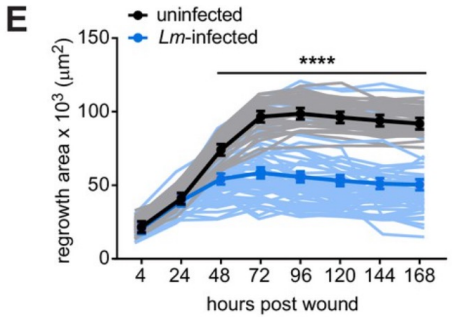
Image Types & Software

1) diagram



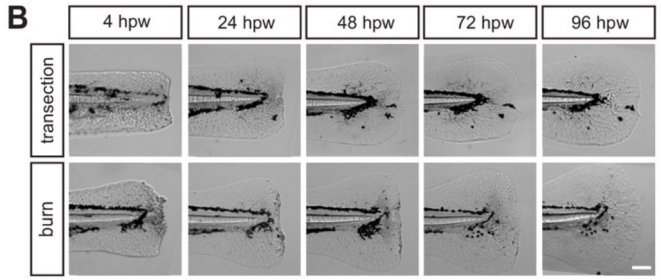
- Powerpoint/ Keynote
- Inkscape */ Illustrator
- Biorender *

2) graphical data



- Excel
- R */ Jupyter Notebooks *
- Powerpoint/ Illustrator

3) scientific images



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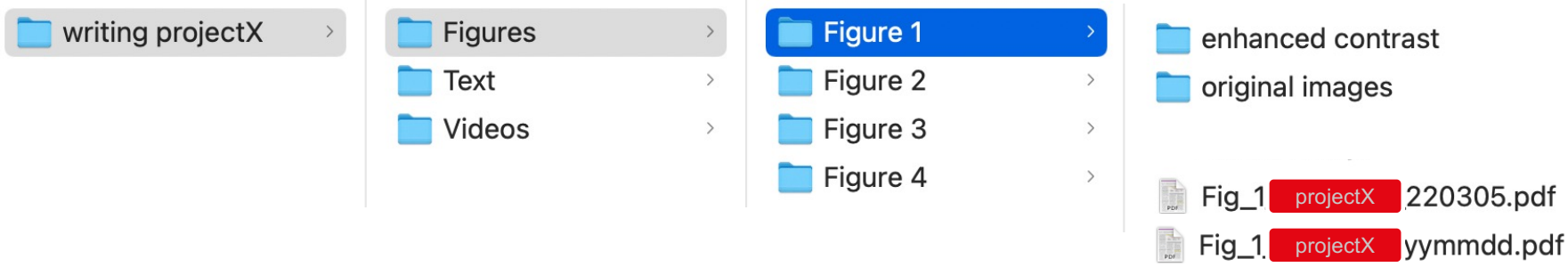
- FIJI *
- Photoshop
- Powerpoint/ Illustrator

* open source/ free

File organization

- keep raw data with metadata (camera, microcope...)
- save images in .tiff format (NOT .jpeg)
- save modifications as separate file (brightness/contrast/crop...)
- simple file names with dates (projects may last years)



Number Figures

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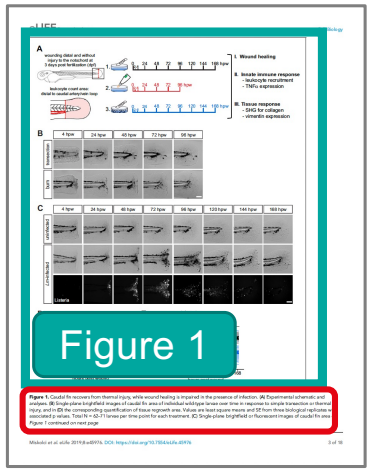
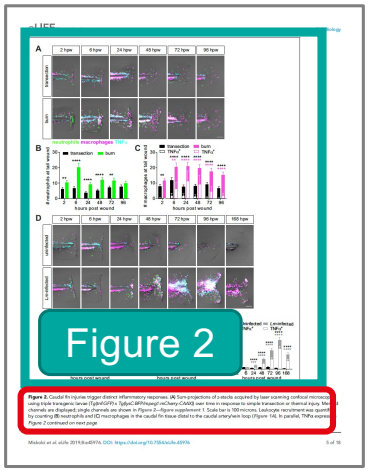
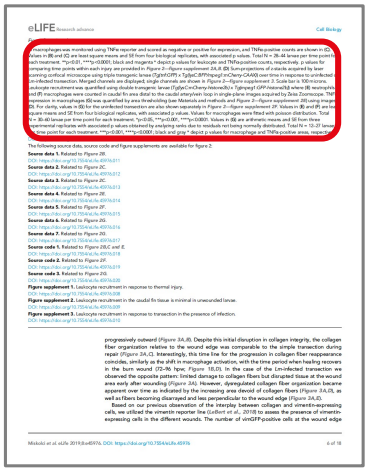
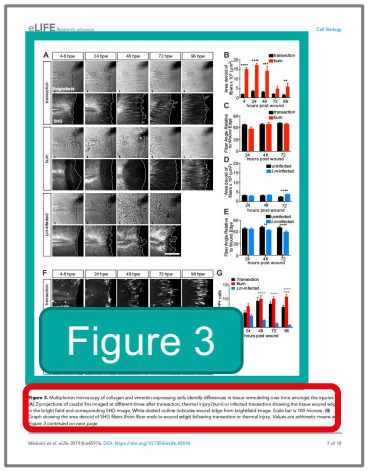
Figure

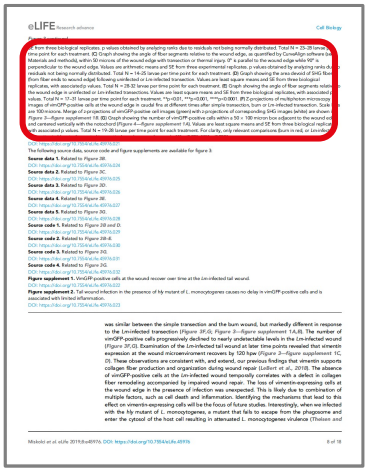
Legend











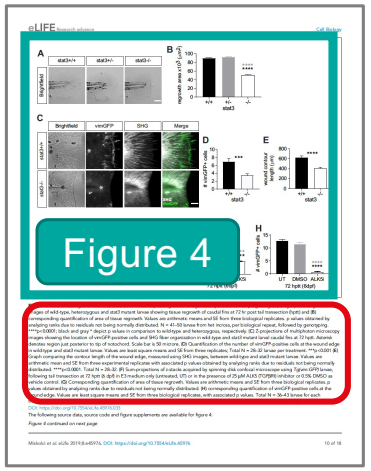


Figure checklist

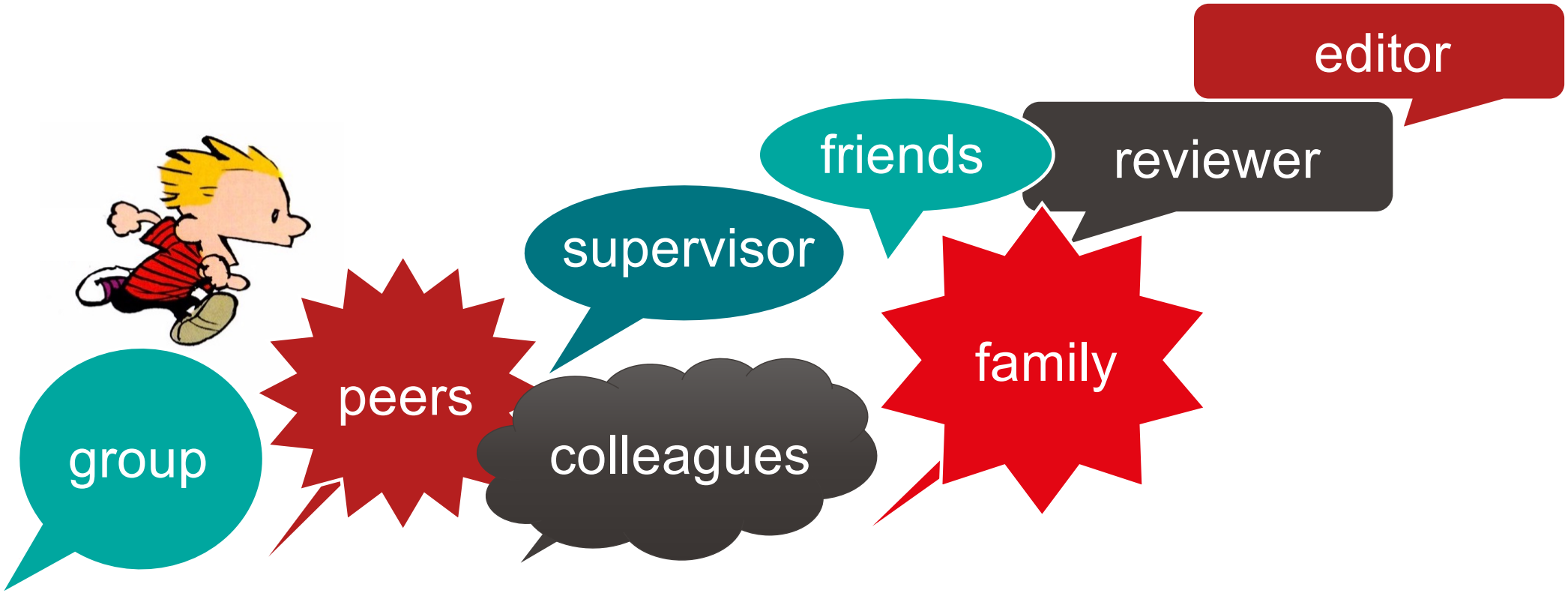
- ❑ clear message
- ❑ visibility of data
- ❑ size & arrangement
- ❑ units & labels

- ❑ font
- ❑ lines
- ❑ colors
- ❑ consistency

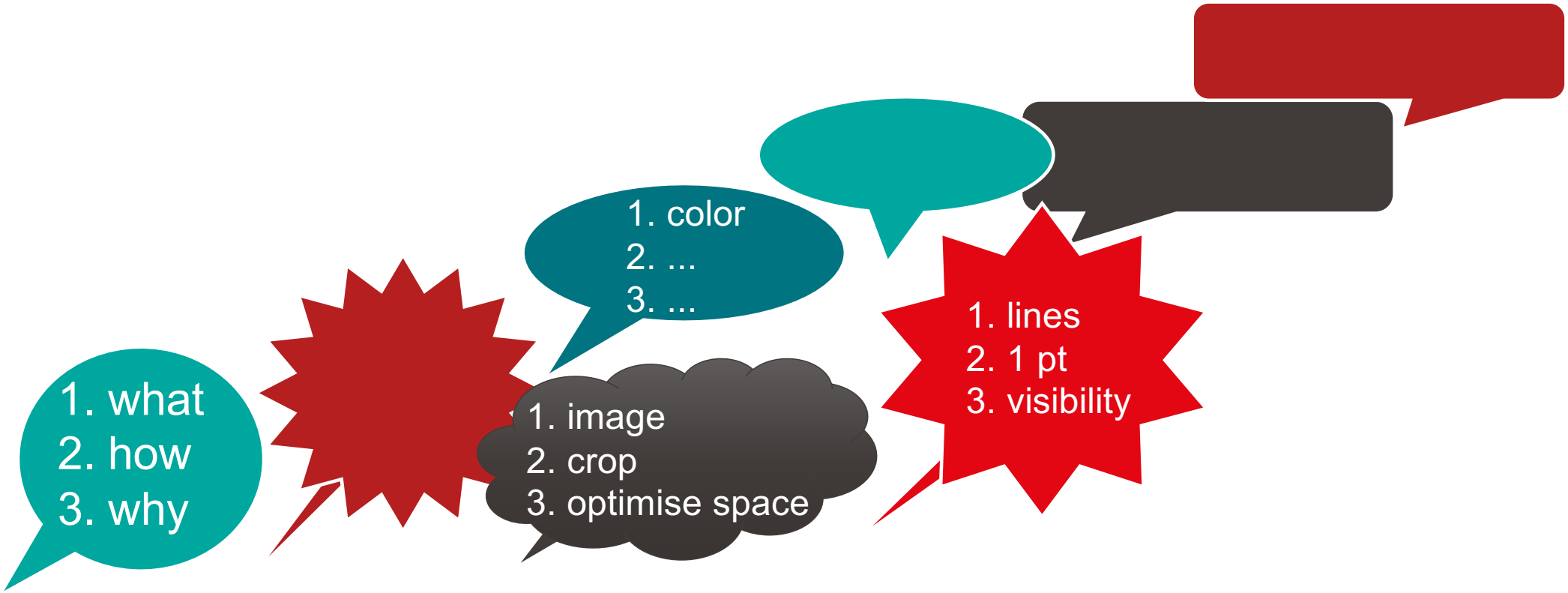
- know audience!
- do not hide data + remove clutter
- text readable/ not pixelated
- label axes, samples, controls

- single font, (Arial 8pt/ 10pt) no serif
- thickness: 0.25-1 pt
- use few! red-green blindness
- same font/ colors/ lines/ arrows...

Seek feedback + Know Your Audience!



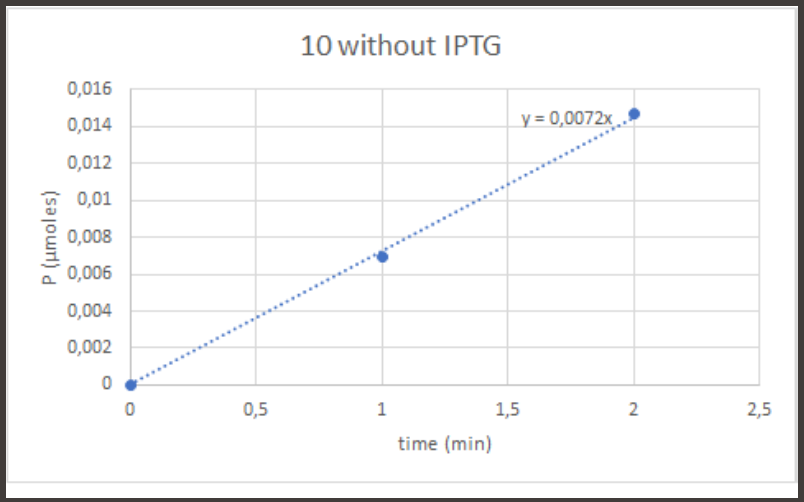
Giving clear figure feedback

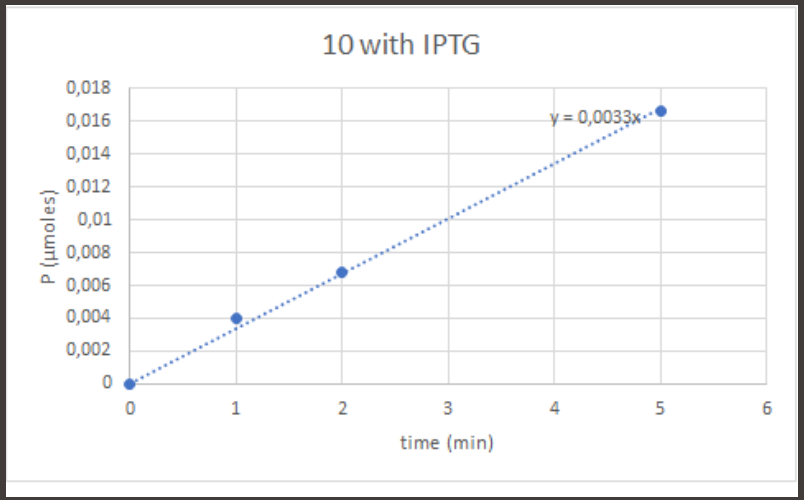


Give Feedback

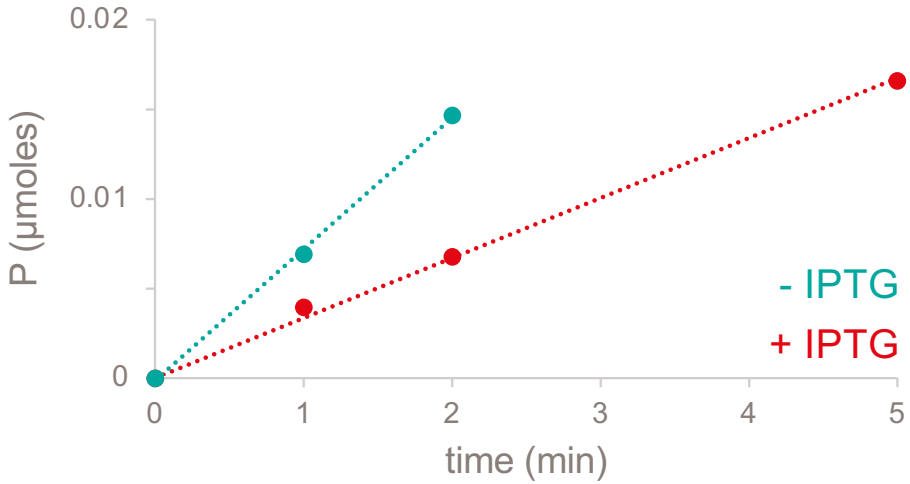
- clear message
- visibility of data
- size & arrangement
- units & labels

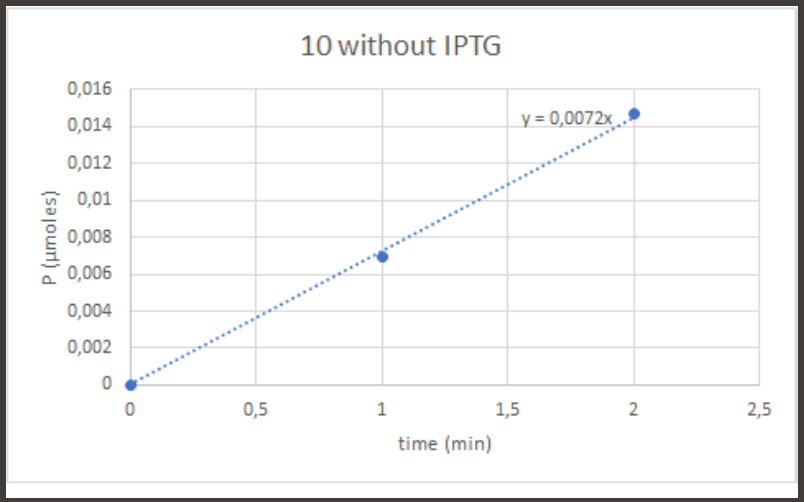
- font
- lines
- colors
- consistency

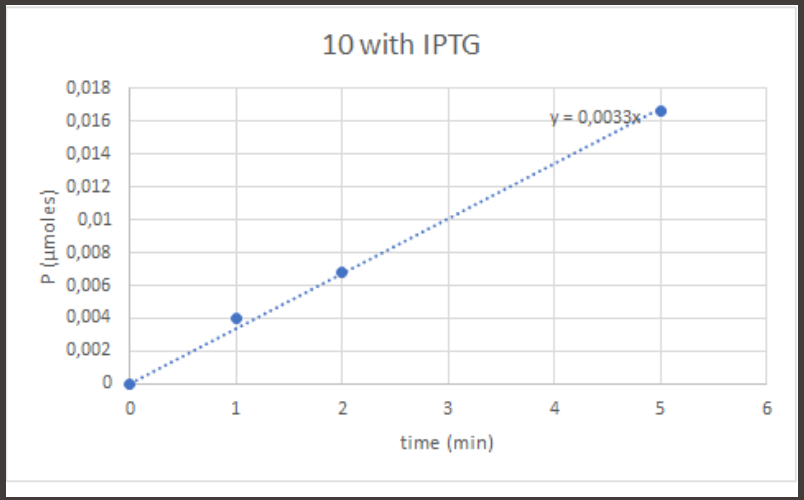




Same Axis
Remove clutter







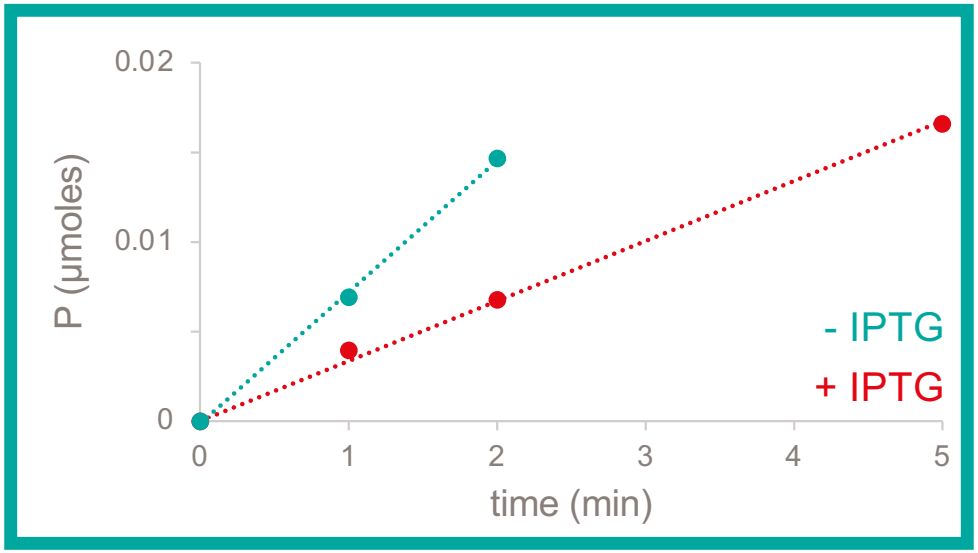


Figure legend

-

Figure Legend = Mini Abstract of Figure

- ✓ **The figure legend is a very short text**
- ✓ **Briefly states method and samples used**
- ✓ **Placed below the figure**
- ✓ **Indicate source if image from internet/ article etc**

Figure & legend are **concise** and **comprehensive**
i.e self-explanatory WITHOUT going to the text/ methods

A Good Figure Legend is NOT

Dont's

- a keyword
- a list of keywords
- pointing elsewhere
- using possesive nouns
- referring to order of experiments
- embedded in figure (always keep a text file)

examples

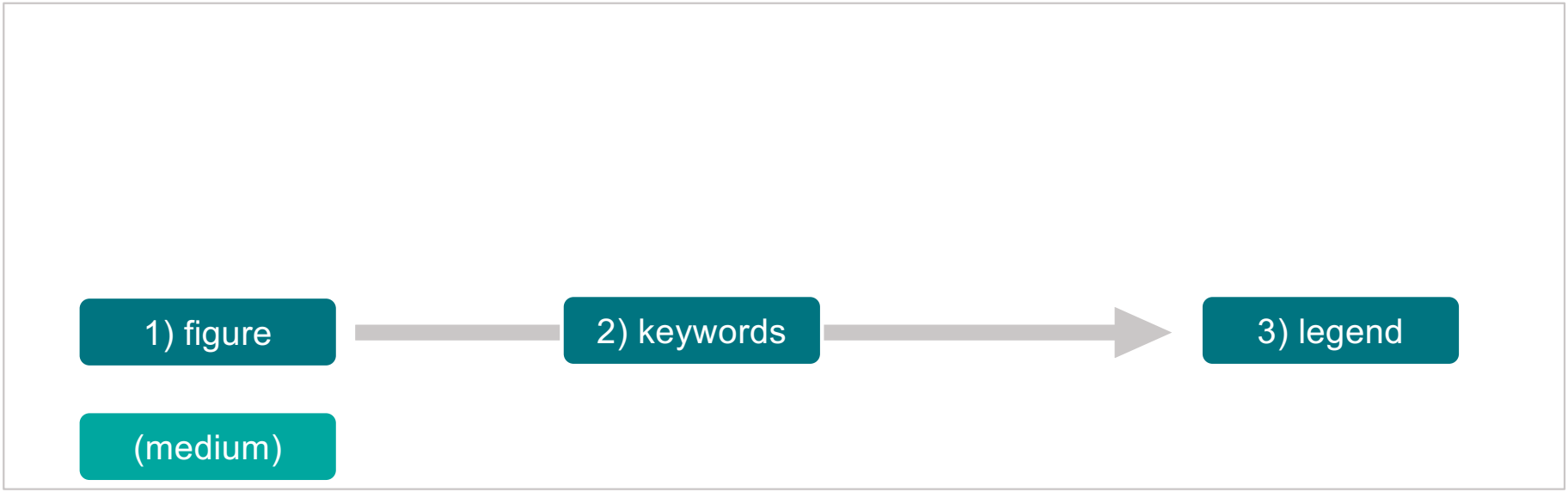
- *gel electrophoresis*
- *ladder, plasmid undigested + digested*
- *see methods*
- *our sample*
- *lab 2*

Figure Legend Structure = Mini Abstract

- Figure X: Title
- Methods
- (Results)
- Definitions/ descriptions

- Figure X: Compoud X inhibits growth of X cells.
- western blot with anti-actin antibody
- (purification of protein X from sample X)
- arrowhead indicates cell division

Steps in Figure Legend Writing

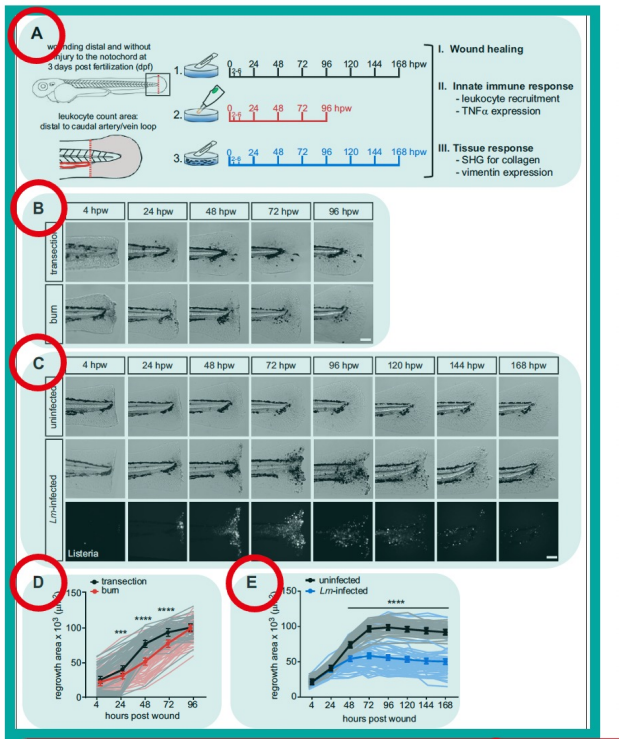


message suitable for audience & medium

- method
- sample
- results (facts)

- figure #
- panel #
- titel
- sentences

How to Write a Figure Legend



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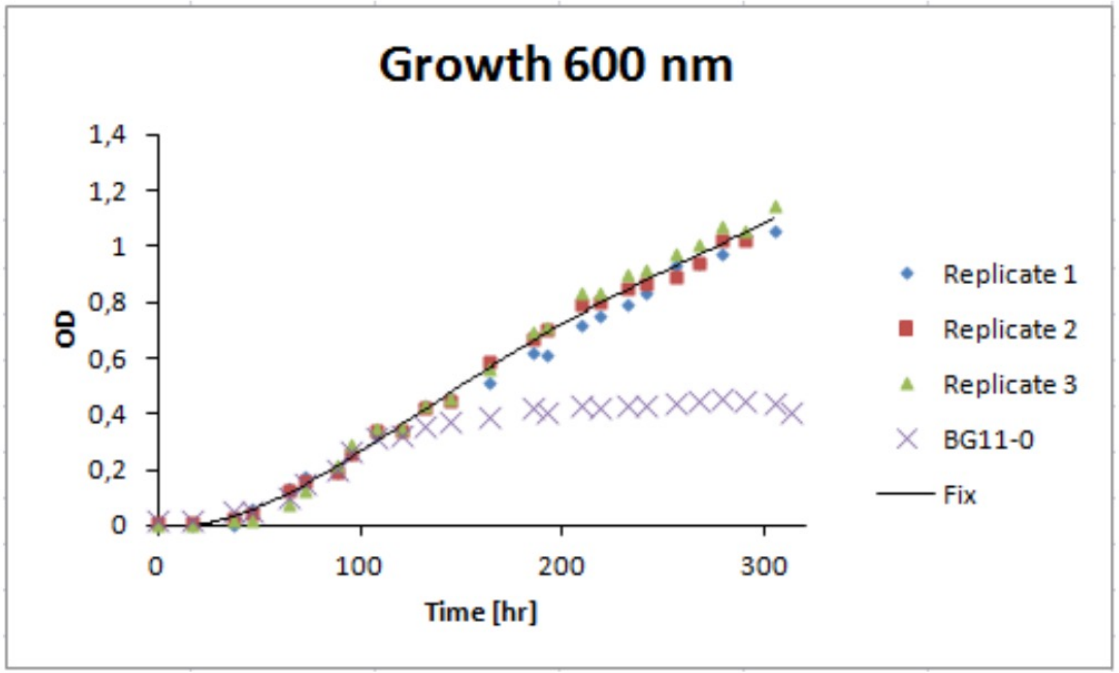
For each panel

- list keywords (2-6)
- rank by importance (potentially remove lowest ranks)
- formulate sentences
  - title (top ranked words)
  - mention method
  - result (if not part of title)
  - all definitions (lines, arrows, units, abbreviations)
- shorten, remove unnecessary words
- consistency (units, terminology, abbreviations)
- seek feedback

Let's Collect Keywords

Model at 600 nm:

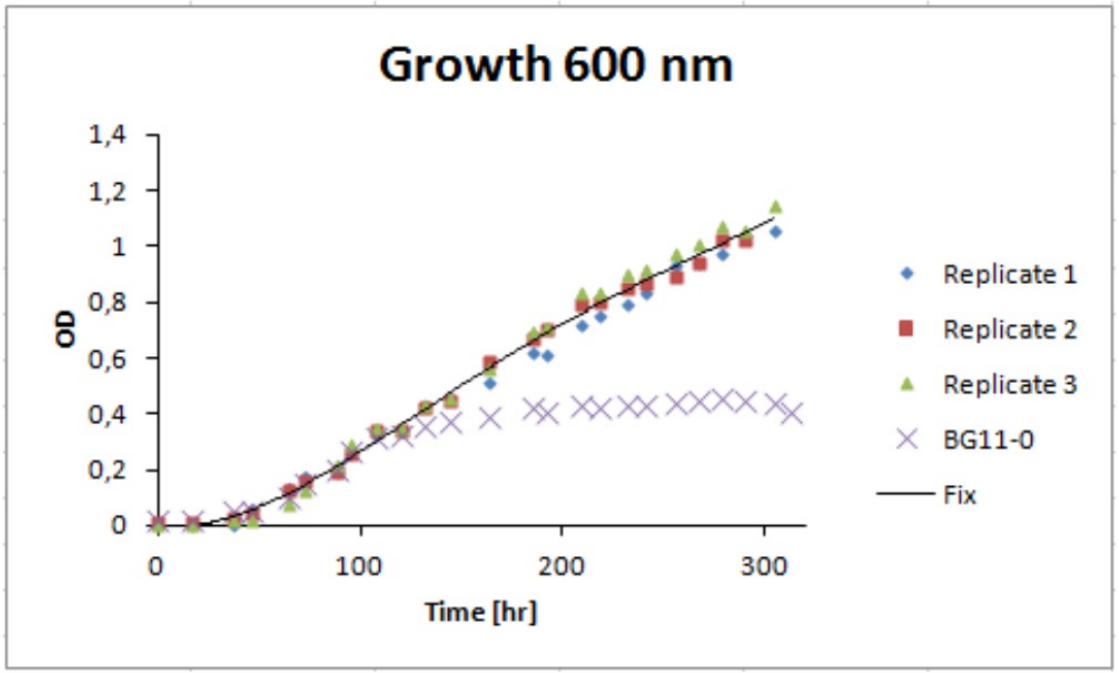


https://2012.igem.org/Team:UC_Chile/Results/Growthcurve

this figure has only a title, no legend!

Let's Collect Keywords

Model at 600 nm:

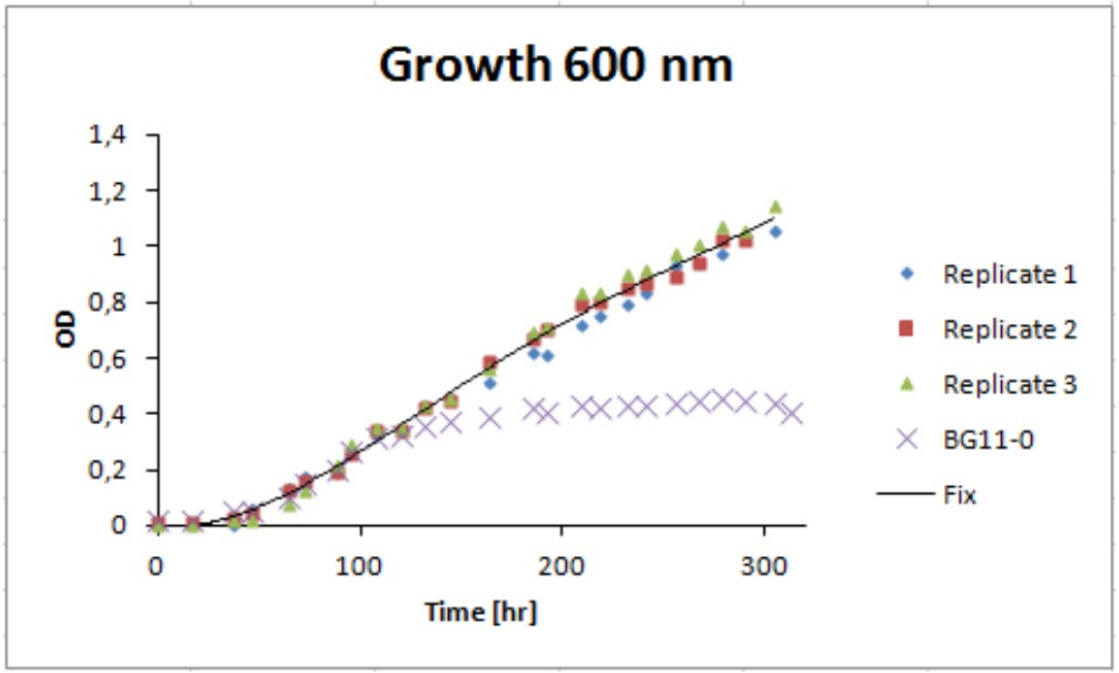


this figure has only a title, no legend!

- ✓ cell type/ organism
- ✓ growth curve
- ✓ absorbance 600 nm
- ✓ optical density
- ✓ time 0-350 h
- ✓ time intervals measurements
- ✓ replicates 1-3
- ✓ treatment BG11-0
- ✓ trendline
- ✓ blue, red, green
- ✓ cross
- ✓ trendline
- ✓ ...

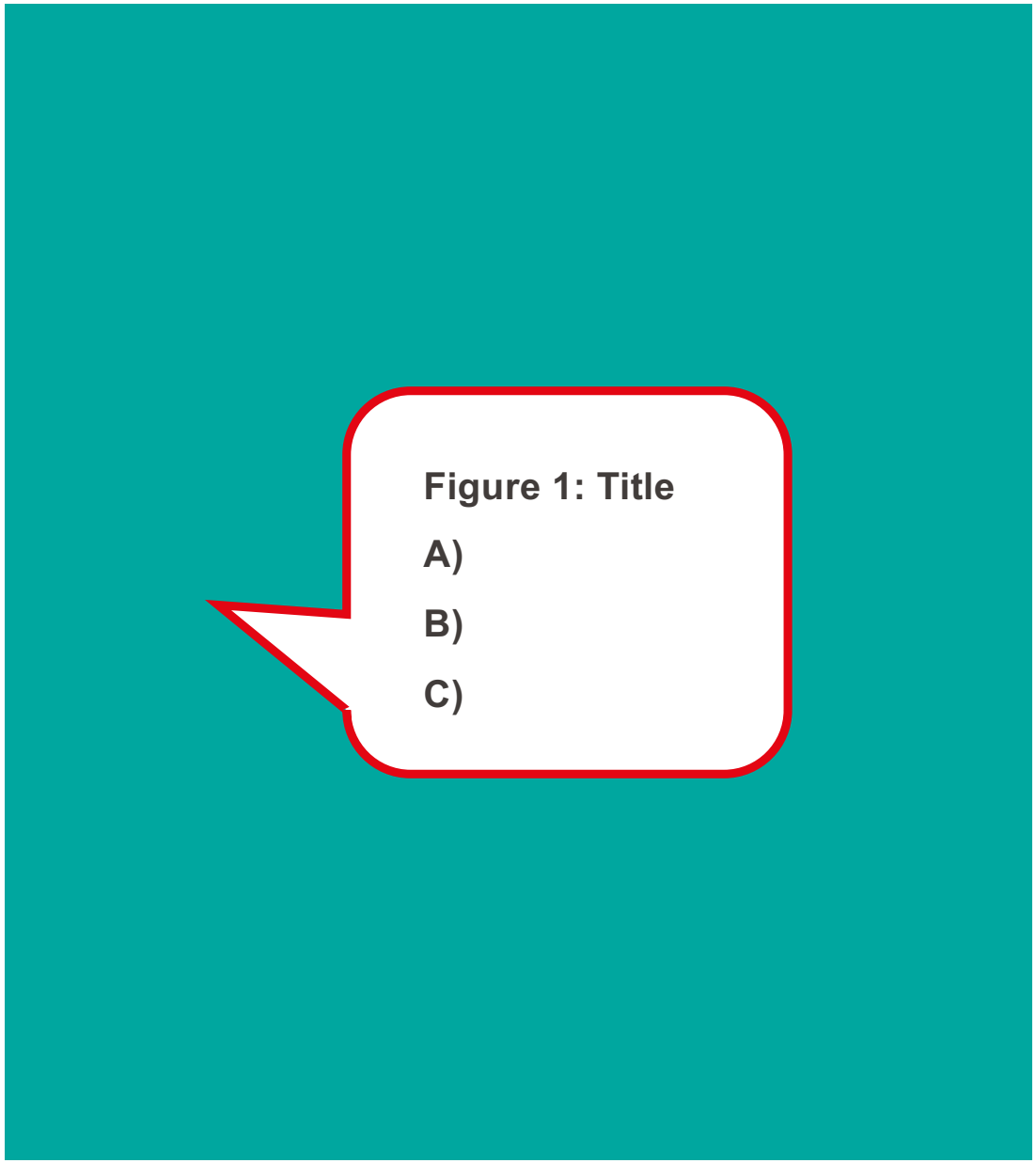
https://2012.igem.org/Team:UC_Chile/Results/Growthcurve

Example Figure Legend



https://2012.igem.org/Team:UC_Chile/Results/Growthcurve

Figure 1: BG11-0 treatment inhibits E. coli growth. Absorbance at 600 nm was measured every X minutes from E. coli cultures from 0-350 minutes (N=3, blue, red, green). The trendline shows the average of the replicates. Inhibition by the drug BG11-0 is shown with crosses (N=1).



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For final report

- ❑ one title for all figure panels
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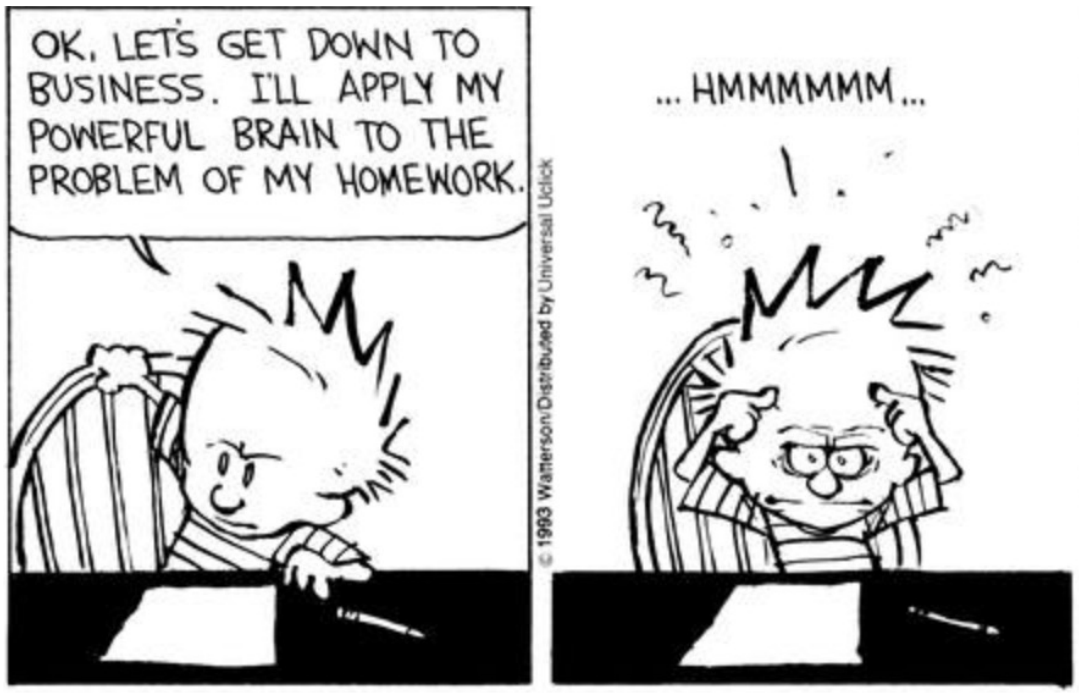
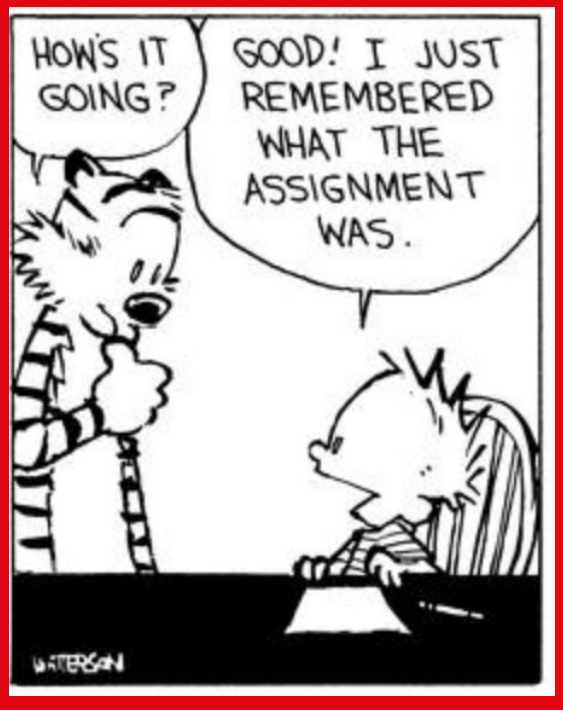
- ❑ label panels A, B, C

See you soon!





Calvin & Hobbes
by Bill Waterson